

### EXAMINER'S AMENDMENT

1. Claims 1-3, 5, and 12 are pending in the instant application.
2. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Van C. Ernest on April 23, 2009.

The application has been amended as follows wherein the following versions of claims 1 and 12 replace all prior versions in their entirety:

1. A method for correcting impairments on information, passing through an information transmission system, imposed by a plurality of defective elements of the information transmission system for generating, transporting, and receiving the information, the method comprising:

identifying the defective elements imposing impairments on the information and individually characterizing each defect by performing a frequency analysis of each defective element;

determining, for each defective element, a frequency characteristic complementary to said frequency analysis in matrix form, such that a combination of said frequency analysis and said complementary frequency characteristic, when applied to information passing through said element, corrects the impairment imposed by said defective element; and

creating a composite, two channel I and Q finite impulse response filter, having I-I and Q-Q direct components and I-Q and Q-I cross components, by combining said complementary frequency characteristics, said filter being positioned in said information transmission system for correcting said impairments imposed on the information by said

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defective elements.

12. In applying a generalized two-channel digital filter to process an input data stream  $x$  and to produce an output data stream  $y$ , wherein both  $x$  and  $y$  are two-component signals  $x_I$ ,  $x_Q$ ,  $y_I$ , and  $y_Q$  which are processed in blocks of  $N/2$  data values long,  $N$  being a power of 2, and wherein the filter is characterized by four independent impulse response vectors  $h_{11}$ ,  $h_{12}$ ,  $h_{21}$ , and  $h_{22}$ , ~~each vector of length  $N/2$~~ , a method for efficiently computing said output data stream  $y$ , comprising the preliminary steps of:

a) forming the vectors

$$a = \frac{(h_{11} + h_{22}) + j(h_{21} - h_{12})}{2} \quad \text{and} \quad b = \frac{(h_{11} - h_{22}) + j(h_{21} + h_{12})}{2}$$

b) appending  $N/2$  zeros to each vector  $a$  and  $b$  and performing an FFT on each vector  $a$  and  $b$  to produce  $A_k$  and  $B_k$ , respectively; and, for each block of  $N/2$  data values in said input data stream  $x$ , additionally comprising the iterative steps of:

c) moving ~~the~~  $a$  previous block of input data values to ~~the~~  $a$  first half of an input vector  $x_N$  of length  $N$  and loading ~~the~~  $a$  current block of input data values into ~~the~~  $a$  second half of said input vector  $x_N$ ;

d) treating  $x_N$  as a vector of complex numbers of the form  $x_I + jx_Q$ , and performing a  $N$ -point FFT to produce  $X_k$ ;

e) computing the complex vector  $Y_k = A_k X_k + B_k X_{N-k}$ , wherein  $0 \leq k < N/2$ , and performing an inverse FFT on ~~the result~~  $Y_k$  to produce the complex vector  $y_n$ ;

f) designating the second half of  $y_n$  as the  $N/2$  output samples of the current iteration, according to  $y_{In} = \text{Real}(y_Q)$ ,  $y_n = \text{Imag}(y_n)$ , where  $N/2 \leq n < N$ ; and

g) returning to step (c) for the next block of  $N/2$  data values.

**Claims 1-3, 5, and 12 are renumbered respectively as claims 1-5, and the claim dependency is renumbered accordingly.**

***Allowable Subject Matter***

3. Claims 1-3, 5, and 12 are respectively as claims 1-5 are allowed.

***Conclusion***

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to JASON M. PERILLA whose telephone number is (571)272-3055. The examiner can normally be reached on M-F 8-5 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chieh M. Fan can be reached on (571) 272-3042. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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/Jason M Perilla/  
Primary Examiner, Art Unit 2611  
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